IN THE

# Supreme Court of the United States

**October Term, 1941**
**No. 680**

U. S. INDUSTRIAL CHEMICALS, INC.,
*Petitioner,*

*vs.*

CARBIDE AND CARBON CHEMICALS CORPORATION,
*Respondent.*

## PETITION FOR REHEARING.

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## PETITION FOR REHEARING

The opinion of the Court states that the "voluntary introduction of water into the reaction chamber" is described as optional by the reissue specification, whereas it had not been so described by the original, and concludes hence that the new claims of the reissue are invalid.

Respondent petitions for a rehearing of the question whether such difference invalidates the new claims of the reissue as not for the "same invention" as the original. The Court's opinion as rendered is inconsistent with elementary principles of chemistry.

Respondent presents the following reasons for the petition:

## I.

By statutory requirement a patent disclosure is addressed to those "skilled in the art or science to which it appertains".

The invention at bar is concededly of *pioneer character* in the abstruse field of catalytic chemistry, yet the Court has substituted its own opinion for the opinion of qualified chemists (to whom alone the patents are addressed), both on the question of what the *invention is* which the patents disclose and on the question of parity of alternative procedures as embodiments of *that invention*.

The Court's opinion states:

> "the court may be aided in understanding not what the instruments mean but what they actually say."

Certainly the statutory requirement allowing a reissue patent only for the "same invention" as the original deals with *substance* and not with immaterialities.

> "It is not the *construction of the instrument, but the character of the thing invented*, which is sought in questions of identity and diversity of inventions."
>
> *Bischoff* v. *Wethered*, 76 U. S. 812 (816).

> "In determining about similarities and differences, courts of justice are not governed merely by the names of things; but they look at the machines and their devices in the light of what they do, or what office or function they perform, and how they perform it, and find that a thing is substantially the same as another, if it performs substantially the same function or office in substantially the same way to obtain substantially the same result; and that devices are substantially different when they perform different duties in a substantially different way, or produce substantially a different result."
>
> *Bates* v. *Coe*, 98 U. S. 31, 42.

If, as the present opinion indicates, the Court may *not* be enlightened as to the *substance* of patent-disclosed inventions ("what the instruments mean" *to workers in the art*) then it is of slight interest whether it understands what patents "actually say". On the other hand, if the Court intended to concede admissibility of testimony as to what patents "actually say" *to persons skilled in the art*, then the Court seems to be unaware that it rejected the conclusive testimony of two such persons, wholly disinterested, on that precise question.

Dr. Arthur B. Lamb, Director of Chemical Laboratory of Harvard University, was handed a copy of the original Lefort patent prior to trial and asked to carry out the process as disclosed thereby by him as one skilled in the art, and to report what he *did* in carrying out this assignment. *He did not know that the patent had been reissued* nor that any controversy was pending. He merely practiced what the original patent "actually said" to him. Having done so, Dr. Lamb was called as a witness and testified to what he actually *did* in translating the printed instructions of the patent to an operating embodiment of the invention thereby disclosed (R. I. pp. 237-260).

The Court now holds, in effect, that Dr. Lamb's procedure was *not* set forth in the original patent, although he was guided by nothing else!

Likewise, Dr. J. C. W. Frazer of Johns Hopkins University (selected by the District Court as a disinterested advisory expert in the art), testified that, to practice the invention disclosed to him by the original patent, he would actually have conducted *the same procedure* which Dr. Lamb conducted (R. II. p. 71).

The testimony of these two chemists is thus on the precise question of what the original patent specification "actually says" *to the only persons whose understanding is legally relevant*—namely, to those skilled in the art to which the invention pertains. In the present case their testimony

is controlling on that question. The rejection of this testimony in the opinion rendered amounts to no less than the substitution of the Court's *opinion* in place of skilled chemists' *knowledge* as to what a document dealing with chemistry discloses to a chemist. The errors of scientific fact into which the Court has fallen are the not unnatural consequence of its error in disposing of the case on what the patents say to *it* instead of what they say to *persons skilled in the art.*

II.

Having found the difference between the original and reissue, again the Court substitutes its own judgment for the judgment of skilled workers in the art as to the *significance* of that difference to the chemical *invention* involved. There is no testimony in the record which warrants the conclusion that such difference is other than immaterial from the viewpoint of the *invention* disclosed and intended to be claimed by the original Lefort patent.

The witnesses on both sides testified that, for all purposes of the issues of the case with respect to water, consideration must be limited to the reaction zone (R. II. pp. 96-97). Thus considering the process, there are *in this zone,* by disclosure of the reissue as well as the *original* specification, identically the same ingredients (ethylene, oxygen and water), identically the same conditions (a temperature of 150° to 400° C. and a silver catalyst), identically the same reactions, and identically the same end products. Neither the original nor reissue mentions or is concerned with *proportions* of ethylene, oxygen and water relative to each other; and it is agreed the proportions are immaterial. It is not disputed that Lefort made a *broad invention* of radically new character. Despite this established fact, and with neither the issue nor the evidence on the issue before it, *the Court in effect has held Lefort's*

*invention was so extremely narrow that it did not embrace even a functionally immaterial variation of known equivalency.* Only on this premise can the conclusion rest that the reissue is not for "the same invention" as the original.

In the case of *Abercrombie & Fitch* v. *Baldwin*, 245 U. S. 198, the Court had before it a question of difference between original and reissue specifications in a simple mechanical device. The original specification described an element as *bent*, and the reissue pointed out that it might be *straight*. There was no question of the *factual* difference, but it was obvious to the Court that such difference was immaterial from the aspect of the *invention*, and the reissue was held directed to the same invention. In the present case the difference as to water is to a skilled worker in the art even more obviously immaterial from the aspect of Lefort's originally patented *invention*.

## III.

The error which underlies the Court's opinion may be demonstrated by comparing two assumed procedures as follows.

In one, atmospheric air containing 2% of water is first dried, and then rehumidified by adding the same 2% of water, and then passed with ethylene through a reaction zone in the presence of silver and at a temperature of 250° C. to yield ethylene oxide in given amount.

In the other, the same atmospheric air, already containing the desired 2% of water, is passed with ethylene through the same reaction zone under the same conditions to yield the same quantity of the same desired product.

In both cases, the same ingredients enter the reaction zone, the same controlled reactions occur, and the same products leave it. The only difference is that in the second case one has omitted the useless and mutually nullifying

operations of taking water out of the air with one hand and "voluntarily introducing" it to the air with the other.[1] The second is not a different *invention* from the first.

## IV.

The found difference between the *specifications* of the original and reissue patents as to the introduction of water does *not* exist between the claims of the original and reissue. It is the latter—the claims—which constitute definitions of the *invention* in the scope as intended to be patented, i. e., *the patented invention.*

The specification must describe an operative embodiment, which embodiment may include any number of unessential details, but such details (when unexpressed in the claim and alike unnecessary to operativeness and patentability) do not inhere in nor measure the *invention patented.*

The original Lefort patent *claims* (see Claim 1 for example) define the invention without any expressed limitation whatever as to the *source* of either oxygen or water. Since, however, the claim itself called for subjecting ethylene "to the simultaneous *action*" of both, both must be *present.* The *presence* (and hence "action") of water is likewise expressly required by reissue claims 8 and 9 as was explicitly conceded by petitioner's counsel at the hearing. Accordingly the found difference between the two *specifications* as to "introduction" of water does not exist in the claims which identify the *invention patented.*

The opinion correctly states the well-known rule,

> "And it is not enough that an invention might have been claimed in the original patent because it was suggested or indicated in the specification. It must appear

[1] It is also worth noting that the defendant operates by leaving the water already in the atmospheric air and *adding more.*

from the face of the instrument that what is covered by the reissue was intended to have been covered and secured by the original."

The opinion then finds that similar facts meet that rule as to one element but not as to another.

Claim 1 of the original patent reads fairly and squarely on the practice of the defendant except for the limitation as to the catalyst. Had this unnecessary and mistaken limitation not occurred in the claim, a reissue of the patent for new claims would not have been sought. Yet the defendant admitted, and the Court correctly accepts, the proposition that claiming *silver* by the reissue is still claiming what "was intended to be covered and secured by the original".

Yet, on the item of water, the new reissue claims do not have even so much difference from original Claim 1, which calls for "subjecting" ethylene "to the simultaneous *action* of oxygen and water". Whatever the "action" of the water *is*, that *action* inevitably occurs if water is *present*.[2]

Consequently, when the opinion states that the important thing is to determine not what the patent *means*, but what it actually *says*, and then holds that in the original patent the "voluntary *introduction*" of water is "described *and claimed* as an integral part of the whole operation", the opinion has become self-contradictory. Claim 1 of the original patent *says* absolutely nothing as to the *introduction* of water. So far as concerns what this claim *says*, it is absolutely immaterial whether the water be *introducted* voluntarily or involuntarily or whether it be *formed in situ* from other *introduced* substances well known to pro-

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[2] It may be that the Court was under the misapprehension that "action" means "reaction". Of course that is not true. The *action* of the water is not one of chemical change. It is one of influencing by its presence, in a manner not even yet wholly fathomed.

duce water. The claim calls for the *action* of water, and not for the *step of introducing it.* The same is true as to oxygen. Naturally either molecular oxygen, or something which yields molecular oxygen, must be *introduced* to the reaction chamber. Naturally, likewise, either water, or some ingredient which yields water, must be *introduced* to the reaction chamber.[3] The *invention* which Lefort *made*, and the invention which he *sought to patent*, was in subjecting ethylene to the simultaneous "action" of oxygen, water, a catalyst, and a certain elevated temperature. The unambiguous language of original Claim 1 has thus paradoxically been held to *mean* something other than it *says*, in the same opinion which states that only what it says is important.

## V.

The Court has erred in many of the factual statements in the opinion made in support of its ultimate conclusion. We think specific discussion at this time is unnecessary. Nevertheless we assert their existence lest the Court assume that any argument above advanced is weakened or rendered unsound by other matters of the opinion not specifically herein treated. Lest this statement itself be dismissed on account of its generality we add a short appendix of specific examples for reference in case the Court considers them important at the present stage.

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[3] Plaintiff's position has been consistent throughout, namely that the introduction of water is no more optional in the reissue than in the original, and no more mandatory in the original than in the reissue, *with respect to the invention made by Lefort, intended to be claimed by the original, and actually claimed by the reissue.* And, furthermore, the difference, assuming one, is *immaterial* to such *invention.*

## VI.

In no earlier reported case of this Court has a reissue patent been held invalid as for a different invention from the original when the alleged difference was *immaterial* either from the viewpoints of means, of mode of operation, of novelty, or of patentability. Likewise in no earlier reported case has such conclusion been reached at the behest of a defendant which was *not practicing* the "difference" it was proclaiming.

Rehearing is requested in order to harmonize the decision with the Record and with elementary chemical principles.

Respectfully,

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## Appendix

1. The opinion states:

> "In contrast, the reissue treats this step as immaterial and mentions the introduction of water as for the mere purpose of controlling the temperature in the reaction zone,—although not even suggested by the specification of the original patent which, on the contrary, in its very first sentence, speaks of the simulfaneous action of the oxygen of air and of water."

Any chemist knows that the process in the reaction zone is exothermic, hence that temperature control is a matter of keeping the temperature *down* to 150° to 400° C., and that, when the original patent speaks of water "checking the formation of carbon dioxide", this "action" of water tends to keep the temperature *down* because the formation of carbon dioxide releases ten times as much heat as does the formation of ethylene oxide.

2. The opinion states:

> "The court below was persuaded by expert testimony that, from a chemist's point of view, the prescribed step (the introduction of water) was immaterial; in other words, chemists testified that, by carrying out the procedure, omitting the introduction of water, they obtained the result described in the patent."

The Court is in error. No witness testified that he omitted the introduction of water, or obtained ethylene oxide without introducing water, in carrying out the procedure of either the original or reissue patent. They varied the *amount* introduced, but *not* the *introduction*. The *amount* has been admitted to be *immaterial* (R. II. p. 92).

3. The opinion states:

> "We think the court below fell into error in adopting the scientific conclusion of expert witnesses that the

result would be the same whether water were introduced into the reaction chamber or not as proof that Lefort's invention was not what he stated it to be in his original patent but rather the invention of a process of bringing ethylene and oxygen into contact in the presence of a catalyst."

The testimony of the expert witnesses was not offered or used below as proof that Lefort's invention was "a process of bringing ethylene and oxygen into contact in the presence of a catalyst" nor has plaintiff ever so urged or the court below so held. Lefort's invention secured by the reissue patent and disclosed as intended to be secured by the original was the process of contacting ethylene and oxygen *and water* in the presence of a catalyst at a *specified temperature.*

4. The opinion states:

"Nor does it [the argument of sufficient water being present from the side reaction] suggest how the reaction can be initiated or caused when dry oxygen is used and the side reaction has not commenced."

Any chemist knows that some ethylene and oxygen would react under the conditions to produce carbon dioxide and water. Being informed that, in the presence of water and the other conditions, ethylene oxide would also be formed, they hence knew that the process would be initiated by the *introduction* of *water* or of such *water-producing* elements. In practice, the "reaction zone" is a long tube of small diameter. Water *formed* therein at any point is cumulatively *introduced* to succeeding points.

5. The opinion states:

"Experiments conducted by the respondent just before it acquired the patent demonstrated that ethylene oxide could be produced by passing ethylene and air over a catalyst at the temperature described in the patent without the voluntary introduction of water."

Both the statement and the implication are in error. In the experiments conducted by respondent, ethylene and oxygen *and water* were *introduced* over the catalyst at the prescribed temperature to produce ethylene oxide. The reissue application was not motivated by reason of any experimental investigation whatever with respect to water nor drawn on any other basis than the exclusive disclosure of the original specification to workers skilled in the art. (R. I. pp. 267, 268, 275, 276)

6. The opinion states:

> "The District Court made no finding directed to this fact, [whether the original specification treated introduction of water as optional] but the court below definitely holds, and we agree, that, in the process defined in the original patent, the voluntary introduction of water into the reaction chamber is mandatory."

The District Court not only made the Finding (8) that Dr. Lamb *followed the original patent* in his procedure, but that what he did

> "conclusively demonstrates that there is no variance between the subject matter of the original and reissued patent".

Moreover, the court below expressly affirmed these Findings.

7. The opinion states:

> "He [Lefort] found that, by certain control of the process, this side reaction could be so restricted as not to decrease the production of ethylene oxide below a profitable level."

This statement that Lefort's restriction of the side reaction had any detectable relation to the "profitable level" of ethylene oxide production by direct oxidation of ethylene

is an assumption without any record support and is factually not true. What made the process commercially profitable was cheapness of its raw materials, its directness, and its specificity to ethylene oxide *as distinguished from aldehydes.*

8. The opinion states:

> "The claims of the original patent are not limited to the oxygen of air; and the specification merely says the oxygen 'can be the oxygen of air.' The specification and claims of the reissue are satisfied by the introduction of dry oxygen."

The "introduction of dry oxygen" satisfies the specifications and claims of *both* the original and reissue, *but only if the other conditions including the presence of water are also met.* The *presence* of water is satisfied in the claims of both patents, as a matter of elementary chemistry and a matter of sound law, by its *introduction* into the reaction zone either as water or as a well-known water-former.

We particularize these errors so frankly because it is apparent that the Court has been misled into accepting defendant's fallacious arguments by our own fault in not earlier pointing out why those same arguments, when urged on both courts below, were rejected.

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We hereby certify that the foregoing petition is presented in good faith and not for delay.

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# SUPREME COURT OF THE UNITED STATES.

No. 680.—October Term, 1941.

U. S. Industrial Chemicals, Inc., Petitioner, *vs.* Carbide and Carbon Chemicals Corporation. } On Writ of Certiorari to the United States Circuit Court of Appeals for the Fourth Circuit.

[March 30, 1942.]

Mr. Justice Roberts delivered the opinion of the Court.

This is a suit by the respondent to restrain the petitioner from infringing claims 8 and 9 of reissue patent No. 20,370. The application for reissue was filed September 25, 1936, and granted May 18, 1937. The original patent was No. 1,998,878, applied for March 22, 1932, and granted April 23, 1935, to Theodore Emile Lefort, of Paris, France, for a "Process for the Production of Ethylene Oxide". The application was based on earlier French patents. The respondent purchased the United States patent in April 1936 and, as a result of its study thereof, the patentee was persuaded to apply for the reissue.

If the reissue patent is valid, no question is now raised as to petitioner's infringement of the claims in suit. The District Court held the patent valid and infringed.[1] The Circuit Court of Appeals affirmed.[2] We took the case because of an apparent conflict with decisions of this court and several Circuit Courts of Appeals, to the effect that a reissue patent must, under the statute, be for the same invention as the original patent.[3] The petitioner

[1] 34 F. Supp. 813.

[2] 121 F. 2d 665.

[3] R. S. 4916, 35 U. S. C. § 64: "Whenever any patent is wholly or partially inoperative or invalid, by reason of a defective or insufficient specification, or by reason of the patentee claiming as his own invention or discovery more than he had a right to claim as new, if the error has arisen by inadvertence, accident, or mistake, and without any fraudulent or deceptive intention, the Commissioner shall . . . cause a patent for the *same invention*, and in accordance with the corrected specification, to be reissued." . . . (Italics supplied.)

also raised a question as to intervening rights which, in the view we take, need not be considered or decided.

Ethylene is a hydrocarbon gas, $C_2H_4$. For a long time it was thought impossible directly to oxygenize it to form $C_2H_4O$ by bringing oxygen and ethylene into contact, though the formation of ethylene oxide by direct oxidation was commercially desirable. Efforts at direct oxidation, instead of producing the oxide, resulted in less desirable oxygenated compounds such as aldehydes. Lefort conceived the idea of effecting the oxidation by catalytic reaction, that is, the use of a substance, which, in some unexplained way, causes a chemical union or reaction when the two substances to be affected are brought into contact in its presence under given conditions. He recognized one incident of the direct oxidation process as applied to ethylene tending to decrease its efficiency, namely, that, in addition to the principal reaction producing $C_2H_4O$, there occurs a side reaction by which a portion of the ethylene is converted into carbon dioxide and water, and, to that extent, the ethylene is wasted. He found that, by certain control of the process, this side reaction could be so restricted as not to decrease the production of ethylene oxide below a profitable level.

According to both the original patent and the reissue, ethylene and oxygen are to be introduced into a heated reaction chamber in the presence of a catalyzer. The petitioner insists that the original patent also treats as a mandatory or necessary step the voluntary introduction of water, whereas the reissue in specification and claims 8 and 9 omits this requirement, and therefore describes a different process. The respondent, on the other hand, asserts that as both patents describe the oxygen of air as that which may be used, and as atmospheric air contains moisture, the first, specifying water, and the reissue specifying air, both contemplate the introduction of water in some form and therefore are for the same process.[4] This dispute must be resolved by a comparison of the disclosures of the two instruments.

[4] No question of unreasonable delay is presented. Compare Mahan v. Harwood, 112 U. S. 354, 363; Ives v. Sargent, 119 U. S. 652, 661; Topliff v. Topliff, 145 U. S. 156, 169. Nor have we occasion to decide what may be the scope of permissible court review of the commissioner's determination that the error of the patentee arose "by inadvertence, accident or mistake, without fraudulent or deceptive intention."

If that comparison leads to the conclusion that the reissue is not for the same invention as the original, the reissue is void as not within the terms of the statute.

We shall postpone discussion of the tests of identity or difference of invention, and the use of expert testimony, to a statement of the criteria of judgment furnished by the language of the specifications and claims of the two documents.

The opening paragraph of the original patent is:

"This invention has for object a process for the production of ethylene oxide which mainly consists in subjecting ethylene to the simultaneous action of the oxygen of air and of water in presence of a catalyzer and, if need be, of hydrogen."

After referring to the use of hydrogen as optional, the specification deals with the character and composition of metals to be used as catalyzers. It then speaks of the elements to be used to obtain the desired reaction thus:

"The ethylene can be obtained from any source of supply:

"Water can be admitted to the reaction vessel, either in the liquid state, or as steam.

"The oxygen can be the oxygen of the air, this latter gas being introduced in the reaction."

Immediately following, it is said:

"The efficiency of the reaction is increased by diminishing the $CO_2$ which is formed, by introduction, in this reaction, of a suitable quantity of water. A suitable quantity of $CO_2$ can also be previously introduced in the reacting gases."

The $CO_2$ which it is desired to diminish is that which is formed by the undesirable side reaction above mentioned. This reaction is again mentioned, and the introduction of water again specified thus:

"Moreover, the applicant has found that the reaction giving $CO_2$ is, contrarily to previous belief, a reaction of oxidation independent from that giving ethylene oxide and from that giving aldehydes. From experiments effected by the applicant, it results that, if water is introduced in suitable quantity, the reaction is not only facilitated, as above stated, but, in addition, the reaction giving $CO_2$, probably by direct oxidation of ethylene according to the equation

$$C_2H_4 + 3O_2 = 2H_2O + 2CO_2$$

is checked, owing, as is probable, to the partial pressure of water."

It is further said that the experiments indicate that the side reaction producing $CO_2$ and water may be completely checked and the efficiency of the reaction producing ethylene oxide increased if $CO_2$ is previously introduced in addition to the water and the reacting gases.

Three *modi operandi* are next indicated as examples. In the first, compressed ethylene and compressed air are led, with or without hydrogen, into a heated tube containing the catalyzer, the tube being connected with a circulating pump to supply water under pressure. In the second, the catalyzer is introduced and the tube heated and then "a mixture of ethylene, air, water vapour and hydrogen" is sent through the tube. In the third, the catalyzer is introduced into a high-pressure tube filled with water. Pure ethylene is added "in order that it can dissolve in the water." The tube is heated and "air and hydrogen are slowly introduced."

The specification concludes:

"The experiments . . . have shown that, in presence of the catalyzers indicated, water, in the form of steam or not, considerably promotes the reaction ensuring the production of ethylene oxide."

All of the seven claims include oxygen and water or steam. Claim 1 is typical. It runs:

"A process for the production of ethylene oxide, consisting in subjecting ethylene to the simultaneous action of oxygen and water, in presence of a catalyst [describing the catalyst] at a temperature between 150 and 400° C."

In some of the claims the word "steam" is substituted for "water"; in two, "hydrogen" is added.

Various options or alternatives are mentioned in the specifications, but nowhere in them, or in the claims, is the introduction of water treated as optional or permissive. The District Court made no finding directed to this fact, but the court below definitely holds, and we agree, that, in the process defined in the original patent, the voluntary introduction of water into the reaction chamber is mandatory.

Experiments conducted by the respondent just before it acquired the patent demonstrated that ethylene oxide could be produced by passing ethylene and air over a catalyst at the temperature described in the patent without the voluntary introduction of water. Its patent attorney was asked to study the patent and he concluded

that Lefort should have obtained far broader claims. He prepared two oaths for execution by Lefort to support the application for reissue.

In the first it was averred that the specification and claims failed to emphasize the fact that the reaction takes place "whether or not water is present"; and that the attorney in drawing the application had not been adequately instructed that the "fullest benefit and application" of the invention was the production of the oxide in the presence of the catalyst "with or without the inclusion of water in the reaction".

After rejection, the second affidavit was filed. This stated that a certain amount of water was necessarily present in the reaction chamber due to the side reaction which gives $CO_2$ and water, and that the introduction of additional water and carbon dioxide was merely permissive in order to augment the quantities already formed by that reaction.

Thereupon reissue was granted with a rewritten specification, the seven original claims and two new ones, 8 and 9, which are those in suit.

The substituted specification opens thus:

"This invention provides a specific and novel process for making ethylene oxide. It essentially consists in causing ethylene to combine directly with molecular oxygen at temperatures of about 150° to about 400° C. in the presence of a surface catalyst which favors the oxidation of ethylene to ethylene oxide under these conditions."

The statement is made that ethylene from any source can be used, and that the oxygen can be that of the air.

The only reference to the introduction of water is:

"The oxidation of ethylene takes place with a giving off of heat, and it is, of course, desirable to maintain the temperature of the zone of reaction within the range specified. This can be facilitated by suitable dilution of the reaction gases, such as that accomplished by the use of air as the source of oxygen, and some water or carbon dioxide in addition to that formed can be admitted to the mixture in the reaction zone if desired. Hydrogen may be similarly added."

The description of the mode of conducting the process differs from all those given in the original specification in omitting the introduction of water.

The specification concludes:

"In any case, the ethylene and oxygen are thus reacted simultaneously at the temperatures set forth in the presence of a surface catalyst and of water" . . .

The new claims 8 and 9 are broader than those of the original patent.[5] It will suffice to quote 8. It is:

"The process of making ethylene oxide by the direct chemical combination of oxygen with ethylene in the proportions of one atom of oxygen to one molecule of ethylene, which comprises forming a mixture containing ethylene and molecular oxygen and conducting said mixture through a confined reaction zone which is maintained at an elevated temperature; controlling said temperature to maintain said mixture in said zone at a temperature between about 150° and about 400° C; subjecting said mixture in said zone at said elevated controlled temperature to intimate contact with an active surface catalyst" [describing it, *inter alia*, as one which favors the formation of "oxidation products containing ethylene oxide in the presence of water."] and describing other steps not necessary to be recited.

The question is whether, in the light of the disclosures contained in the two patents, they are for the same invention. This court has said that they are if the reissue fully describes and claims the very invention intended to be secured by the original patent;[6] if the reissue describes and claims only those things which were embraced in the invention intended to have been secured by the original patent;[7] if the broader claims in the reissue are not merely suggested or indicated in the original specification but constitute parts or portions of the invention which were intended or sought to be covered or secured by the original patent.[8] The required intention does not appear if the additional matter covered by the claims of the reissue is not disclosed in the original patent.[9] If there be failure of disclosure in the original patent of matter claimed in the reissue, it will not aid the patentee that the new matter covered by the reissue was within his knowl-

[5] This fact, standing alone, does not vitiate the reissue. Topliff v. Topliff, 145 U. S. 156.

[6] Powder Co. v. Powder Works, 98 U. S. 126, 138.

[7] Parker & Whipple Co. v. Yale Clock Co., 123 U. S. 87, 99; Hoskin v. Fisher, 125 U. S. 217, 223; Flower v. Detroit, 127 U. S. 563, 571.

[8] Corbin Cabinet Lock Co. v. Eagle Lock Co., 150 U. S. 38, 42.

[9] Clements v. Odorless Excavating Apparatus Co., 109 U. S. 641, 647; Coon v. Wilson, 113 U. S. 268, 277; Electric Gas Lighting Co. v. Boston Electric Co., 139 U. S. 481, 501; Freeman v. Osmus, 145 U. S. 226, 239; Olin v. Timken, 155 U. S. 141, 147.

edge when he applied for his original patent.[10] And it is not enough that an invention might have been claimed in the original patent because it was suggested or indicated in the specification. It must appear from the face of the instrument that what is covered by the reissue was intended to have been covered and secured by the original.[11]

As the Circuit Court of Appeals held, the original specification and claims treated the voluntary introduction of water into the reaction chamber as a necessary step in the process whereas such introduction is made permissive by the reissue. We agree with that court's view that there is thus a difference between the procedure described in the two documents. But we cannot agree with its conclusion that the difference is so insubstantial as not to invalidate the new claims 8 and 9. On the face of the papers the process described in the original patent included a step not designated as optional or desirable but described and claimed as an integral part of the whole operation. In contrast, the reissue treats this step as immaterial and mentions the introduction of water as for the mere purpose of controlling the temperature in the reaction zone,—a thought not even suggested by the specification of the original patent which, on the contrary, in its very first sentence, speaks of the simultaneous action of the oxygen of air and of water.

We think it plain that the reissue omitted a step in the process which was described and claimed as essential in the original patent. The court below was persuaded by expert testimony that, from a chemist's point of view, the prescribed step (the introduction of water) was immaterial; in other words, chemists testified that, by carrying out the procedure, omitting the introduction of water, they obtained the results described in the patent. Naturally enough this fact led them to state, as chemists, that the introduction of the water was immaterial. Apparently this testimony induced both of the courts below to conclude that Lefort, when he applied for his original patent, knew that the introduction of water was unnecessary. The inquiry at once arises, if this were so, why did he not say so. If he had discovered a process, which the claims of

[10] Powder Co. *v.* Powder Works, *supra*, p. 138; Manufacturing Co. *v.* Ladd, 102 U. S. 408, 413; Huber *v.* Nelson Mfg. Co., 148 U. S. 270.

[11] Parker & Whipple Co. *v.* Yale Clock Co., *supra*; Flower *v.* Detroit, *supra*.

the reissue are certainly broad enough to cover,—that of mixing dry oxygen and ethylene in the presence of a catalyst at the prescribed temperature to produce ethylene oxide,—it is not understood why, throughout his specifications and claims, he spoke of exposing ethylene to the simultaneous action of oxygen and water or steam.

We think the court below fell into error in adopting the scientific conclusion of expert witnesses that the result would be the same whether water were introduced into the reaction chamber or not as proof that Lefort's invention was not what he stated it to be in his original patent but rather the invention of a process of bringing ethylene and oxygen into contact in the presence of a catalyst.

Although it is the duty of a court to determine for itself, by examination of the original and the reissue, whether they are for the same invention, it is permissible, and often necessary, to receive expert evidence to ascertain the meaning of a technical or scientific term or term of art so that the court may be aided in understanding not what the instruments mean but what they actually say.[12] It is inadmissible to enlarge the scope of the original patent by recourse to expert testimony to the effect that a process described and claimed in the reissue, different from that described and claimed in the original patent, is, because equally efficacious, in substance that claimed originally.[13] If such testimony could tip the scales on the issue of the validity of a reissue, it would always be possible to substitute any new combination of steps or elements or devices for the one originally described and claimed by proving that the omission of any one or more steps would not alter the result.

This court has uniformly held that the omission from a reissue patent of one of the steps or elements prescribed in the original, thus broadening the claims to cover a new and different combination, renders the reissue void, even though the result attained is the same as that brought about by following the process claimed in the original patent.

In *Russell* v. *Dodge*, 93 U. S. 460, the original patent was for treating skins by the use of a compound in which heated fat liquor was expressly stated as an essential ingredient. There was no dis-

[12] Seymour *v.* Osborne, 11 Wall. 516, 546.
[13] Collar Co. *v.* Van Dusen, 23 Wall. 530, 557.

closure that the fat liquor could be used cold. In a reissue the specification was altered by eliminating the requirement that the liquor be heated. The court said:

"The change made in the old specification, by eliminating the necessity of using the fat liquor in a heated condition, and making in the new specification its use in that condition a mere matter of convenience, and the insertion of an independent claim for the use of fat liquor in the treatment of leather generally, operated to enlarge the character and scope of the invention. The evident object of the patentee in seeking a reissue was not to correct any defects in specification or claim, but to change both, and thus obtain, in fact, a patent for a different invention. This result the law, as we have seen, does not permit."

In *Gill* v. *Wells*, 22 Wall. 1, the original patent disclosed and claimed a machine for making hat bodies. One of the elements of the machine was a tunnel through which a current of air was to be passed. The specifications did not indicate that this part could be omitted. The reissue for a machine without any tunnel, was held invalid. The court said (p. 26):

"Argument to show that an invention consisting of a combination of three ingredients which are old is not the same as that of a combination of four old ingredients is quite unnecessary, as the negative of the proposition is as well settled in the patent law as it is in mathematics."

Many other cases might be cited to the same effect.

The court below was persuaded to construe the reissue patent as not differing from the original by the argument that, in both, the introduction of water was not essential to the technological success of the process. When certiorari was applied for in this court, the respondent in its brief said: "The introduction of water, as distinguished from its presence, in the reaction zone is not 'an essential feature' in the invention at bar, and was not 'described and claimed in the original patent as an essential feature.'"

This argument goes upon the theory that if the presence of water is necessary to the reaction, its presence is assured by the side reaction we have mentioned which produces $CO_2$ and water. It does not explain, however, why, if this is the source of the necessary water, Lefort did not say so in his original patent. Nor does it suggest how the reaction can be initiated or caused when dry oxygen is used and the side reaction has not commenced.

In the argument on the merits in this court, the respondent shifted its position. In brief and argument it stated that both the original and reissue cover the same invention for if both require the introduction of water, the described introduction of air effects also the introduction of water since atmospheric air contains both oxygen and moisture. It is thus sought to avoid the finding of the Circuit Court of Appeals that the original patent called for the voluntary introduction of water and the reissue does not. This argument fails to square with the specification or claims of either the original patent or the reissue. The claims of the original patent are not limited to the oxygen of air; and the specification merely says the oxygen "can be the oxygen of air." The specification and claims of the reissue are satisfied by the introduction of dry oxygen.

In short, to avoid the difficulties which stare one in the face when the attempt is made to read specifications and claims as calling for the same process, the respondent is driven to take inconsistent positions neither of which comports with the plain language of the two patents.

We hold that the reissue is not for the same invention described and claimed and intended to be secured by the original patent and is, therefore, void.

*The decree is reversed.*

A true copy.

Test:

*Clerk, Supreme Court, U. S.*